

Claims

What is claimed is:

1. A method of growing a thin film onto a substrate located within a
5 reaction chamber comprising feeding a precursor of said film into said reaction
chamber, causing said precursor to adsorb onto the surface of the substrate to form a
layer thereof, and feeding a catalyst into said reaction chamber in an amount to
substantially convert said layer of said precursor to said thin film.

10 2. The method of claim 1 wherein any non-adsorbed precursor is removed
from the proximity of the substrate before feeding the catalyst into the reaction
chamber.

15 3. The method of claim 1 wherein subsequent to feeding the catalyst into
the reaction chamber the catalyst is removed from the proximity of the substrate.

20 4. The method of claim 1 wherein said steps of feeding the precursor,
removing excess precursor, feeding a catalyst, and removing catalyst and unwanted
reaction products, are repeated to achieve a desired film thickness on said substrate.

25 5. The method of claim 3 wherein a purge gas is fed into said reaction
space after said precursor but before said catalyst is fed to said reaction space.

30 6. The method of claim 5 wherein said purge gas is also introduced into
said reaction space after said catalyst but before said precursor of a subsequent
deposition cycle is fed to said reaction space.

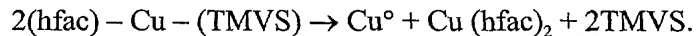
7. The method of claim 1 wherein a carrier gas is introduced into said
reaction chamber continuously during the practice of said method, whereby the carrier
gas functions as a purge gas for said reaction chamber.

8. The method of claim 1 wherein said precursor comprises
hexafluoroacetylacetonate – Cu – trimethylvinylsilane.

9. The method of claim 8 wherein said catalyst comprises water and said film comprises copper.

5 10. The method of claim 1 wherein said substrate is heated.

11. A method of forming a copper film on a substrate comprising feeding a precursor of hexafluoracetylacetonate – Cu – trimethylvinylsilane into a reaction chamber, causing said precursor to adsorb onto the surface of said substrate to form a layer thereof, and feeding water as a catalyst into said reaction chamber in an amount to substantially form said copper film pursuant to the following reaction:



12. A method of growing a thin film onto a substrate located with a reaction chamber comprising feeding a precursor of said film into said reaction chamber, causing said precursor to adsorb onto the surface of the substrate to form a layer thereof, and feeding a catalyst and said precursor into said reaction chamber in amounts to substantially convert said layer of said precursor to said thin film.

13. The method of claim 12 wherein any non-adsorbed precursor is removed from the proximity of the substrate before feeding the catalyst and precursor into the reaction chamber.

14. The method of claim 12 wherein subsequent to the step of feeding precursor and catalyst into the reaction chamber the catalyst, residual precursor, if any, and unwanted reaction products, if any, are removed from the reaction chamber.

15. The method of claim 14 wherein said steps of feeding the precursor, removing excess precursor, if any, feeding the catalyst and the precursor, and removing the catalyst and excess precursor, if any, and unwanted reaction products, if any, are repeated to achieve a desired film thickness on said substrate.

10052049-01602
PAGE 10

16. The method of claim 12 wherein purge gas is fed into said reaction chamber after said precursor but before said catalyst and precursor are fed to said reaction chamber.

5 17. The method of claim 16 wherein said purge gas is also introduced into said reaction chamber after said catalyst and precursor are simultaneously introduced, but before said precursor of a subsequent deposition cycle is fed to said reaction chamber.

10 18. The method of claim 12 wherein purge gas is introduced into said reaction chamber continuously during the practice of said method, whereby the purge gas functions as a carrier gas.

15 19. The method of claim 12 wherein said precursor comprises hexafluoracetylacetonate – Cu – trimethylvinylsilane.

20. The method of claim 19 wherein said catalyst comprises water and said film comprises copper.

202504-011601